8611 Smart Router
Fully Redundant, Scalable Network Element for LTE and IP/Ethernet RAN Access Aggregation

The Coriant™ 8611 Smart Router is a compact and highly modular next-generation access element. It offers high data delivery capacity in LTE, 4G and 3G networks. With a switching capacity of up to 7.5 Gbps and 5.5 Gbps with Simple IMIX packet size distribution, the 8611 Smart Router is cost-efficient, powerful and easy to scale. With 7 slots for physical interface modules, the 8611 Smart Router is ideal for service providers’ large cell sites or small hub aggregation sites in areas where there is demand for high capacity aggregation. The interface and power feed modularity improves various site configurations and also optimizes cost and maintenance of inventory management. The fully redundant switching and control module (SCM) enables unsurpassed carrier class reliability.

FEATURES AND BENEFITS
The 8611 Smart Router has a packet-based forwarding architecture with Quality of Service (QoS) awareness, enabling network optimization for voice and data services in LTE and 3G networks. The advanced QoS features enable the differentiation of premium and best effort data services for real-time voice and video services. Environmentally hardened, the 2 RU high 8611 Smart Router is a modular router and includes Gigabit Ethernet, Fast Ethernet, 10G Ethernet, and E1/T1 Line Modules that are easily changed by the user. It includes hot swappable power units and fan modules which are also easy to change.

CARRIER-CLASS RELIABILITY
The 8611 Smart Router provides carrier-class reliability via the redundant Switching and Control Module (SCM).

ROBUST SYNCHRONIZATION
The 8611 Smart Router supports a high quality Oven Controlled Crystal Oscillator (OCXO), which provides excellent temperature stability for IEEE 1588v2 and adaptive timing recovery. It also provides an extremely stable node clock holdover. In addition to adaptive timing and IEEE 1588v2 clock recovery mechanisms, node timing can be obtained from a BITS or GPS source, any PDH, SONET/SDH interface or any of the synchronous Ethernet interfaces.

QUALITY OF SERVICE TESTING IN PACKET NETWORKS
The 8611 Smart Router supports an extensive set of OAM capabilities to ensure network availability and maintain QoS requirements for voice, video and data services. It supports LSP Ping, LSP Traceroute, and Ethernet OAM functions from IEEE 802.1ag and Y.1731. In addition, the Coriant Smart Router product portfolio and Coriant™ 8000 Intelligent Network Manager (INM) support a unique Packet Loop Test tool that enables the testing of QoS parameters including delay, jitter, throughput and connectivity.

BENEFITS OF THE CORIANT™ 8611 SMART ROUTER
- Manage traffic aggregation for large cell sites or small hub aggregation sites
- Provide switching capacity of up to 7.5 Gbps
- Enable flexible LTE network architectures
- Reduce operational expenses with intelligent network management
- Deploy a range of synchronization options
- Deliver carrier class reliability with fully redundant switching
- Support QoS requirements for voice, video and data services
The Smart Router Series

The Smart Router series offers versatile and scalable solutions for mobile backhaul from small aggregation sites to controller and gateway sites. In addition, Smart Routers serve fixed and mobile convergence and cloud computing networking needs. These solutions are designed to meet the ever-growing requirements of data hungry mobile and enterprise users. All of the Smart Routers are LTE-ready and provide an extensive Ethernet and IP/MPLS feature set. Simultaneous support for multiservice applications in access and aggregation networks protects earlier network investments. The Smart Router product family is supported by the 8000 INM, which is an easy to use end-to-end network management solution. The 8000 INM minimizes operational and maintenance costs and scales up to tens of thousands of network elements.

### TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Physical Dimensions</th>
<th>Forwarding Capacity</th>
<th>Chassis Configuration</th>
<th>Power and Cooling</th>
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<tr>
<td>• 441 x 88 x 300 mm / 17.36 x 3.46 x 11.81 in (W x H x D)</td>
<td>• Up to 7.5 Gbps, 5.5 Gbps with Simple IMIX</td>
<td>• Two slots for hot swappable Switching and Control Module (SCM)</td>
<td>• Power feed options</td>
</tr>
<tr>
<td>• Standard 19-inch, 23-inch and ETSI 600 mm rack mounting</td>
<td>• Two slots for power feed modules</td>
<td>• Two slots for power feed modules (one per element)</td>
<td>• User-changeable dual feed wide range (-48 Vdc to +24 Vdc) power module</td>
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<tr>
<td>• 2 RU high</td>
<td>• Four slots for user changeable Line Modules (LM)</td>
<td>• Hot swappable single feed -48 Vdc power module (up to 2 per element)</td>
<td>• Hot swappable single feed wide range (-48 Vdc to +24 Vdc) power module (one per element)</td>
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<tr>
<td></td>
<td>• Three slots for hot swappable High-speed Modules (HM)</td>
<td></td>
<td>• Hot swappable single feed -48 Vdc power module</td>
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<tr>
<td></td>
<td>• Management port on SCN</td>
<td>• External Alarm interface on SCN</td>
<td>• Hot swappable air filter and fan module</td>
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<tr>
<td></td>
<td>• Station Clock Input (SCI) on SCN</td>
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<tr>
<td></td>
<td>• Station Clock Output (SCO) on SCN</td>
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### Forwarding Plane

- IPv4 routing
- MPLS switching (LSR and LER)
- Ethernet MAC switching

### Functionality

- IP VPN (RFC4364)
- Ethernet/VLAN, SAToP, CESoPSN, ATM and HDLC pseudowires
- Single and multi-segment pseudowires
- 802.1ad QinQ
- MPLS-TP Bidirectional LSP
- MPLS-TP 1:1 Linear Protection
- MPLS-TP OAM
- TDM cross connection
- ATM VP/VC switching
- ATM cell concatenation
- ATM IMA
- MC / M-LPPP, PPPmux
- Y.1731 frame loss, frame delay and frame delay variation measurement
- IEEE802.1ag Ethernet OAM loopback, continuity check, ping and link trace
- BFD (Static routes, OSPF, ISIS, RSVP-TE)

### High-speed Modules (HM)

- 4 x Gigabit Ethernet 10/100/1000BASE-TX HM
- 4 x Gigabit Ethernet 100/1000BASE-X HM
- 1 x 10 Gigabit Ethernet HM

### Line Modules (LM)

- 8 x chE1/chT1 LM
- 8 x 10/100BASE-TX LM

### Resiliency and Load Balancing

- Switch fabric protection
- Control plane protection
- Duplicated Synchronization ports
- Duplicated Management Ethernet and CLI ports
- Ethernet Link Aggregation
- 1:1 RSVP-TE LSP protection
- Fast Reroute (FRR)
- Pseudowire redundancy (Ethernet, ATM, TDM)
- IP load balancing (Equal Cost Multipath - ECMP)
- IPv4 and IP VPN load balancing to RSVP-TE tunnels

### Security

- L3/L4 Access Control Lists
- Denial of service protection
- RADIUS and TACACS+ authentication and accounting
- SSH-2 for FTP and Telnet
- MD5, SHA-1, SHA-256 authentication

### Synchronization

- ITU-T [G.813] option 1
- ITU-T [G.8262]
- Telcordia [GR-1244] Stratum-3
- Station Clock Input and Output ports
- E1/T1 line synchronization
- Synchronous Ethernet
- SSM over Ethernet [G.8264]
- Adaptive synchronization from SAToP and CESoPSN pseudowires
- IEEE 1588v2 Precision Time Protocol

### IPv4 Routing and MPLS Label Distribution Protocols

- OSPF-TE, ISIS-TE, BGP and MP-BGP
- LDP, RSVP-TE

### Traffic Management

- DiffServ support for up to 7 traffic classes, 7 queues per interface
- DiffServ aware MPLS Traffic Engineering (DS-TE)
- IEEE802.1P/Q mapping to IP or MPLS
- Policing and shaping
- VLAN shaping
- RED/WRED queue management
- Access Control Lists (ACL)
- ATM service categories: CBR, rt-VBR, nrt-VBR, UBR+, UBR

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<th><strong>Management</strong></th>
<th><strong>Standards</strong></th>
<th><strong>Environmental Conditions</strong></th>
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<tbody>
<tr>
<td>• CLI with SSH2, FTP with SSH2</td>
<td>• Safety: EN 60950-1:2006 and IEC60950-1:2005</td>
<td>• Storage: ETSI EN 300 019-1-1, Class 11. Temperature: –5°C to 45°C / 23°F to 113°F</td>
</tr>
<tr>
<td>• SNMPv1 and SNMPv2 monitoring</td>
<td>• EMC:</td>
<td>• Transportation: ETSI EN 300 019-1-2 Class 2.3, Temperature: –40°C to 70°C / –40°F to 158°F</td>
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<tr>
<td>• Coriant 8000 Intelligent Network Manager</td>
<td>• EN 300 386:2008</td>
<td>• Operating conditions: ETSI EN 300 019-1-3, Class 3.2 (non-condensing). Temperature: -40°C to 65°C / -40°F to 149°F. Relative humidity: 5% to 95%</td>
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<tr>
<td>• Smart Router auto-configuration based on DHCP client</td>
<td>• FCC 47 CFR Part 15, Subpart B, Class A</td>
<td>• Minimum cold boot-up temperature: -20°C / -4°F</td>
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<tr>
<td>• RADIUS and TACACS+ authentication and accounting</td>
<td>• RTTE Directive 1999/5/EC</td>
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